creamy white; legs black, with the anterior knees, more or less of their tibiae, apical half of middle and hind femora beneath and their tibiae beneath, red. Wings subfuliginous, their veins black.

Epistenia odyneri Ashm. sp. n.

♀. Length, 6 mm. Metallic green with the sides of thorax, hind coxae and first abdominal segment beneath, blue or blue green, the whole surface umbilicately punctate, clothed with a white pubescence. Flagellum beneath rufo-piceus; knees honey yellow, the tibiae and tarsi dark fuscous, almost black, the hind tibiae behind fimbriate with long stiff bristles. Wings hyaline, the veins blackish, the marginal and post marginal veins of an equal length and fully three times as long as the short stigmal vein. Abdomen conico-ovate one-third longer than the head and thorax united, with lateral carinae.

Described from one specimen bred from the cells of *Odynerus rufobasilaris* described above.

NOTES ON THE WINTER INSECT FAUNA OF VIGO COUNTY, INDIANA.— IV.

BY W. S. BLATCHLEY, INDIANAPOLIS, INDIANA.

As the future articles of this series will deal with the Coleoptera, and as the sandy banks of the old Wabash and Erie Canal furnished a most liberal quota of the winter hiding places for the Carabidae, as well as for the Coleoptera in general, a few words of description of these banks will not be out of place.

In the greater part of its course through Vigo County, this canal was constructed at high water mark, adjoining the river terraces on the eastern side of the Wabash River; though in but few places is it near the bed of the river, wide bottoms, cultivated in summer, intervening.

The tow path was on the river side of the canal and in many places (especially near some large ponds in the bottoms) vast beds of sand have been piled up against it by the annual freshets. On these beds of sand, drift-wood from time to time accumulates, beneath which scores of species of Coleoptera find an agreeable summer or winter home.

To the late Dr. Frederick Stein* of this city and to Mr. H. F. Wickham of Iowa City, Iowa, I owe many of the identifications of the beetles named in this and future articles. The arrangement and nomenclature followed is that of Henshaw's "List of the Coleoptera of North America."

COLEOPTERA.

Carabidae.

Among the winter insects occurring in Vigo County no family surpasses the Carabidae in number of species, or in

*Dr. Stein died in April of last year. He was an enthusiastic student of Coleoptera, and his collection of that order was the largest in Indiana.

individuals. Their life being spent almost wholly upon the ground, the appearance of frost and cold weather but causes them to burrow more deeply into the vegetable mold or sand beneath the logs, stones, and other materials which furnish them a ready shelter during summer days. Hence, to one familiar with their habits, it will be no surprise to learn that of 217 species known to occur in the county, specimens of 77 were taken during the winter months; and I doubt not that a more careful and systematic search than I was enabled to make will disclose fully one half of those inhabiting the county to be partially or wholly represented in winter by the mature form.

1, *Scarites subterraneus* Fab. A single specimen, Jan. 1, from sand, beneath a log, on side of canal. This and the variety, *substriatus* Hald., are common in similar localities in early spring.

2, *Clivina ferrea* Lec. Dec. 29, Feb 10. One each date beneath log in upland woods. Also common in March along the canal.

3, *Panageus fasciatus* Say. Uncommon. Taken on three different occasions in winter only from beneath logs along the canal.

4, *Bembidium dorsale* Say. Feb. 11.

5, *B. variegatum* Say. Dec. 25.

6, *B. intermedium* Kirby. Dec. 25–Feb. 14.

7, *B. sp.?* Jan. 1.

8, *B. quadrimaculatum* Linn. On numerous dates.

9, *B. sp.?* Jan. 21.

Of 15 species of this genus found in the county the above are all that were taken in winter. They occurred either singly or in pairs beneath logs and chunks in low, damp places.

10, *Tachys proximus* Say. Feb. 2.

11, *T. nanus* Gyll.

12, *T. flavicauda* Say. Jan. 6.

13, *T. sp.?* Jan. 7.

14, *T. incurvus* Say. Jan. 21.

Of these *T. nanus* winters in numbers beneath the close fitting bark of recently felled oak, tulip (*Liriodendron*), hickory and other logs. The others are scarcer and are usually found singly beneath chunks and stones in damp localities.

15, *Patrobus longicornis* Say. On two different occasions, Dec. 25–Jan. 1, beneath logs along the sandy margin of canal.

16, *Pterostichus lucublandus* Say.

17, *P. ebeninus* Dej.

18, *P. caudicalis* Say.

19, *P. tartaricus* Say.

20, *P. mutus* Say.

21, *P. patruelis* Dej.

22, *P. femoralis* Kirby.

Pterostichus is represented in the county by 18 known species. Of these *lucublandus* and *femoralis* are by far the most common. Of the above 7 taken in winter all were beneath logs and chunks; *caudicalis*, *tartaricus*, *mutus*, and *patruelis* only along the sandy margins of the canal— the others in upland woods.

23, *Amara basillaris* Say. Two from beneath mullein leaves, Jan. 13. Other species of this genus undoubtedly

hibernate, having been seen in early March, but not in winter.

24, *Loxandrus rectus* Say.

25, *L. erraticus* Dej.

26, *L. agilis* Dej.

These three species represent the genus in the county. In winter they are found singly or in pairs beneath half buried logs,—preferably those along the sandy sides of canal.

27, *Diplochila laticollis* Lec.

28, *D. obtusa* Lec.

Of these, *laticollis* is rare in winter, *obtusa* rather common; both beneath logs in sandy localities. *Obtusa* often forms a shallow, protective pit in the sand or mold similar in appearance to that of the common ant lion.

29, *Badister pulchellus* Lec. A handsome Carabid, rare in Vigo Co. Taken but once, Jan. 6, from beneath a log in low ground. One other specimen from same locality on March 26.

30, *Calathrus gregarius* Say.

31, *C. opaculus* Lec.

Gregarius is common in winter beneath logs in dry upland woods, while *opaculus* has but one winter record— "Jan. 5, from beneath mullein leaves."

32, *Platynus brunneomarginatus* Mann. Dec. 18.

33, *P. extensicollis* Say. Feb. 21.

34, *P. decorus* Say. The elytra of this species vary much in color. Feb. 8.

35, *P. pusillus* Lec. On numerous occasions.

36, *P. melanarius* Dej. Jan. 1, Jan. 18.

37, *P. cupripennis* Say. Jan. 6.

38, *P. nutans* Say. Jan. 7.

39, *P. octopunctatus* Fab. Jan. 6.

40, *P. obsoletus* Say. Jan. 1–Feb. 14.

41, *P. aeruginosus* Dej. Dec. 18.

42, *P. rubripes* Zimm. Dec. 29.

43, *P. punctiformis* Say. Jan. 5.

44, *P. lutulentus* Lec. Dec. 23.

Of the 19 species of Platynus occurring in Vigo Co., the above 13 were found in winter. *Decorus*, *cupripennis*, *punctiformis* and *lutulentus* are so rare at all seasons that I have no more than three specimens of each of them; the others, especially *pusillus*, *melanarius* and *rubripes* are very common. All were found beneath logs, chunks, pieces of rail, etc., usually singly, but *pusillus*, *melanarius* and *obsoletus* gregarious, along the canal and in upland woods. Two or three specimens of *octopunctatus* were taken each winter on a high sandy hillside near the river.

45, *Olisthopus parmatus* Say. Two specimens only have been taken, one from beneath a chunk in a clearing Jan. 6.

46, *Casnonia pennsylvanica* Linn. This odd-looking beetle can be found beneath pieces of rail along the upland fence rows of the old Virginia rail fences on almost any day in winter.

47, *Galerita janus* Fab. Common enough in summer. But one in winter, Jan. 1, beneath log on side of canal. Our only representative of the genus.

48, *Labia grandis* Hentz.

49, *L. atriventris* Say. Dec. 29.

50, *L. viridipennis* Dej. Dec. 28.

51, *L. bivittata* Fab.

Of these, *grandis* and *bivitatta* are

in winter common beneath chunks in the corners of rail fences about which piles of dead leaves have drifted. *Atriventris* is scarce in winter and *viridipennis* rare at any season, beneath logs in upland woods. Four other species occur in the county; viz., *viridis* Say; *tricolor* Say; *scapulus* Dej.; and *furcatus* Lec.

52, *Cymindis americana* Dej. Rare. One from beneath a log near a stream, Dec. 25.

53, *Apenes sinuata* Say. Also rare, but three having been seen by me at any time. Two of these were taken in winter, Dec. 1–Feb. 14, from beneath logs.

54, *Brachynus fumans* Fab. Of 6 species of "bombardiers" native to the county this is the only one taken in winter. A single specimen which "shot" twice before surrendering was found Jan. 1, beneath a log on side of canal. From April 10th to June the species is excessively common at same place. Does an occasional specimen hibernate or was this one prematurely called forth from its pupal cradle by the several days of mild weather which had preceded its discovery?

55, *Chlaenius erythropus* Germ.

56, *C. sericeus* Forst. Dec. 8.

57, *C. nemoralis* Say. Feb. 20.

58, *C. pennsylvanicus* Say. Jan. 3.

Of thirteen species inhabiting the county, the above represent the ones recorded in winter. The last three were taken on but one occasion each from beneath logs near the borders of swamps. *Erythropus* twice, Jan. 1, Feb. 22, from under logs on canal bank, a place where it is excessively common on the first warm days of March.

59, *Anomoglossus pusillus* Say. One specimen, Jan. 21, from a chunk on side of canal.

60, *Agonoderus pallipes* Fab.

61, *A. partiarius* Say.

Both frequent in winter beneath driftwood near water, and on the wing very early in spring.

62, *Harpalus pennsylvanicus* DeG.

63, *H. compar* Lec.

64, *H. longior* Kirby.

65, *H. montanus** Lec.

The first three beneath logs in dry upland fence corners at various dates in winter. The last one but once, Dec. 18, from a similar locality.

66, *Stenolophus conjunctus* Say.

67, *S. ochropezus* Say.

68, *Bradycellus rupestris* Say.

69, *Tachycellus atrimedius* Say.

70, *T. badiipennis* Hald.

The last five hibernate in numbers beneath logs and rubbish in dry or sandy places, and are very common on the wing during the first warm days of March and April.

71, *Anisodactylus rusticus* Say.

72, *A. baltimorensis* Say.

73, *A. terminatus* Say. Dec. 25.

74, *A. agilis* Dej. Dec. 18.

75, *A. sp.?* Jan 13.

76, *A. lugubris* Dej. Dec. 18.

* I doubt the correct determination of this species. It was so named for me by Dr Stein.

77, *A. interstitialis* Say.

Rusticus, *baltimorensis* and *interstitialis* are rather common throughout the winter. The others are rare at any time and in winter were taken but once on the dates mentioned. All hibernate beneath logs, usually those in sandy localities. Six additional species of the genus have been taken in the county.

FINAL NOTES ON ORGYIA.

BY HARRISON G. DYAR, NEW YORK CITY.

Since my former papers in Psyche on our species of Notolophus (formerly Orgyia), I have bred several of the western forms with the view of establishing their relationships. The species have been carried through several generations and I have thus had them continuously before me for three years. The following conclusions have been arrived at.

Notolophus vetusta Boisd.

gulosa Hy. Edw.; *cana* Hy. Edw.

I recognize but one species in California. I have bred a large number of the larvae of the lupine feeding form (*vetusta*) raised from eggs kindly sent me by Mr. T. G. O. Mueller, Mr. Beverly Letcher and Dr. H. H. Behr. They do not differ from those of *N. gulosa* which I have already described and I found them by no means fastidious as to their food plants. The characters noted by the late Henry Edwards to separate them, I find to be only individual ones, present in varying degrees in different examples from broods of both *vetusta* and *gulosa*. The differences in the moths also are of the same character. I formerly stated (Psyche, vi, 40) that Mr. Edwards had confounded the moths. I see now that this was probably not the case, but that he bred from larvae on lupine the form that I bred from larvae on oak, and the contradiction was due to insufficiency of material in both Mr. Edwards' hands and my own. In the case of *cana*, I showed that there were two black tufts in the young larva, whereas *gulosa* had but one such. During my breeding of *gulosa* among numbers of larvae raised from the egg, a few appeared with the two black tufts. These were isolated and the resulting moths paired together. The larvae from their eggs the next season were all of the *cana* form. The larvae, however, from the moths from which all the *cana* forms had been eliminated varied again the next year, producing about 3 per cent *cana*. Now if we consider that all the other species of Notolophus have the two anterior tufts colored alike, it becomes apparent that this is a case of reversion in *gulosa* and so the greater stability of the *cana* form is accounted for. The sea-coast form, *vetusta-gulosa*, is thus seen to be a modified off-shoot of the more generalized one inhabiting the interior of California;